of development further observations were unfortunately arrested by the death of the whole colony, in consequence of the water becoming impure, and my situation at a distance from the sea preventing my getting an immediate fresh supply. The whole period that I had kept them was not above five or six days, so that their development had been pretty rapid. After the death of the animals the shells remained at the bottom of the glass. They were of an elliptical form, straight at the upper margin, where they were attached, though the hinge did not appear to be yet formed: the whole, excepting in the elongated form, had very little resemblance to the adult shell.

The process which this embryo undergoes in the course of development is similar to what has been observed in the fresh-water bivalves by some continental naturalists, as well as more recently by Professor Lovén of Stockholm in the young of *Kellia rubra*, but as these are viviparous, the metamorphosis takes place before extrusion. Professor Lovén has, however, traced the same metamorphoses in the young of *Modiola discors* (*marmorata*), commencing about the third day after the deposition of the spawn. In the present instance the process likewise commenced about the same time after extrusion, but from the artificial position in which the animal had been placed, there is a possibility that the birth may have been premature, especially as some species of the family are known to be viviparous.

EXPLANATION OF PLATE VI. B.

Fig. 1. *Montacuta ferruginosa*, magnified.
Fig. 2. Anterior portion of the cloak more highly magnified.
Fig. 3 to 7. Different stages in the development of the embryo.
Fig. 8. Shell in the embryo state.

XXI.—*Characters of several new East Indian and South African* Helices, *with remarks on some other species of the Genus occurring at the Cape of Good Hope.* By W. H. Benson, Esq.

1. *Helix Ampulla*, nobis, n. s.

T. imperforata, oblique globoso-ovata, tenuissima, irregulariter plicato-striata, striis antice obsoletioribus, transverse et oblique rugosa, olivacea; anfractibus 3 velociter crescentibus, ultimo inflato, apice convexo-depresso; apertura parum obliqua, rotundato-ovali, intus concolori, peristomate acuto, margine columellari arcuato, tenui, intrante.

Diam. maj. 42 mill., minor 31 mill., axis 30 mill.

Hab. Khoorda Ghat, in montibus Nilghiri dictis, Indiæ Meridionalis. Teste Jerdon.

The strong horny epidermis occupies nearly as much of the

substance of the shell as the calcareous matter, which is exceedingly thin and tender. The shell bears very much the appearance of a large globular *Vitrina*, for which it has been taken; but the rough surface of the shell shows that it has been formed by an animal of very different organization, and its affinities place it near the singular and beautiful Helicophantoid *Helices Waltoni* of Ceylon, and *magnifica* of Madagascar.

2. *H. cacuminifera*, nobis, n. s.

T. obtecte perforata, conica, trochiformi, cornea, spira versus apicem attenuata, apice papillari, obtusiusculo; anfractibus 8, lente crescentibus, supra planatis, spiraliter lineis septem minute moniliferis, lineisque intermediis minutioribus similibus munitis, ultimo acute compresso-carinato, subtus convexo, polito, radiato-striato; apertura securiformi, peristomate acuto, labio superne vix dilatato, reflexo.

Diam. major 19, minor 16, axis 10 mill.

Hab. in cacuminibus montium Nilgheries, teste Jerdon.

A shell singular both in form and sculpture. The profile of the spire is somewhat concave owing to the attenuation of the spire towards the apex.

3. *H. crinigera*, nobis, n. s.

T. anguste umbilicata, depresso-trochiformi, cornea, radiato-costulata; apice obtusiusculo; anfractibus 6–6½, vix convexiusculis, linea unica elevata supersuturali munitis; ultimo carinato, carina suturaque pilis elongatis ciliatis, basi planiuscula, ad umbilicum compressiuscula, lineis impressis concentricis frequentibus ornata; apertura obliqua angulato-lunari, securiformi; peristomate simplici, acuto.

Diam. major 12½, minor 12, alt. 6½ mill.

Hab. ad latus montium "Nilgheries" versus Orientem spectans. Teste Jerdon.

This shell in size and characters is intermediate between *Helix Guerini*, Pfr., an inhabitant of the summits of the Nilghery Mountains, and *H. retifera*, Pfr., which inhabits the warmer valleys of the same range according to Dr. Jerdon, to whom I am indebted for specimens of all the three species from the localities indicated.

4. *H. acuducta*, nobis, n. s.

T. perforata, tenui, lenticulari, conica, acute carinata, superne costulato-striata, lineis impressis confertissime granulato-decussata, subtus lævigata, lineis impressis frequentibus concentrice notata; spira vix elevata, apice obtusiusculo; anfractibus 5, planulatis, fere contabulatis, ultimo subtus tumido, carina infra compressa; apertura

angulato-lunari, subsecuriformi; peristomate tenui, simplice, margine columellari superne brevissime reflexo.

Diam. major 22, minor 19, alt. 11 mill.

Hab. in sylvis ad apicem montium "Nilgheries," Indiæ meridionalis. Jerdon.

This form seems to rank between the perforate *H. anceps, H. Indica,* &c., and the umbilicated *H. Guerini, H. retifera,* &c. At first sight it has the aspect of a depressed and much-carinated dextrorse *Helix interrupta,* Bens., a species which is, however, invariably sinistrorse.

5. *Helix regalis,* nobis, n. s.

T. perforata, sinistrorsa, conoideo-depressa, carinata, eleganter fasciata vel unicolori; anfractibus 6, angustis, subplanatis, supra striis acute corrugatis, obliquis, strias spirales decussantibus, medianis obsolete noduloso-costatis, ultimo carinato, carina infra compressa, subtus nitido, convexo, radiato-striato, striis circularibus versus umbilicum obsoletis; periomphalo excavato; apertura obliqua, subsecuriformi, peristomate acuto, margine inferiori arcuato, versus umbilicum sinuato, columellari brevissime reflexo.

The following is a more extended description of the differences observable in the specimens examined:—

A. costis inconspicuis; anfractibus supra fascia media luteo-fusca, utrinque linea fusco-nigra marginata, fasciisque albido-cæsiis marginalibus ornatis, ultimo subtus fascia media, cinereo-lutea, lata, utrinque fascia angusta purpureo-fusca cincta, margine albido, periomphalo albido-luteo.

B. unicolori, extus intusque purpureo-fusca, costis magis conspicuis.

Diam. maj. 27, minor 25, axis 13 mill.

Hab. ad Sarawak, Insulæ Borneo. Teste W. Taylor.

A couple of specimens of each variety, found on the ground, in jungle, near Sir Jas. Brooke's house at Sarawak, were brought to England by Lieut. W. Taylor, Madras Artillery, to whom I am indebted for an example of each kind. The subnodulous costate appearance of the whorls, above the ultimate one, forms a very peculiar feature in this handsome sinistrorse species.

The following corrected and more extended characters of a fine and remarkable East Indian *Helix,* published by me in the Journal of the Asiatic Society of Calcutta for 1836, and copied thence into Pfeiffer's 'Monograph,' will not be out of place here.

6. *Helix Oxytes,* nobis. Amended character.

T. late umbilicata, orbiculari, depressa, oblique subplicata, ferrugineo-cornea, spira convexa, apice planato; anfractibus $5\frac{1}{2}$ subplanatis, contabulatis, ultimo carinato, subtus tumidiusculo; sutura vix marginata; apertura subquadrato-lunata, valde obliqua, intus albida,

polita, marginibus acutis expansiusculis, callo tenui junctis, inferiori valde arcuato, subreflexo; umbilico lato, profundo, omnes anfractus exhibente, margine subcompresso.

Diam. major 47, minor 40, axis 15 mill.

Benson, J. A. S. vol. v. p. 351.

Pfeiffer, Monograph, vol. i. p. 395. no. 1028.

Hab. in montibus præter fines provinciæ Bengaliæ orientales versus septentrionem spectantes.

The remaining species belong to the south-western termination of the African continent, and are not the only species which escaped the researches of Krauss in the immediate vicinity of Cape Town.

7. *Helix Cotyledonis*, nobis, n. s.

T. imperforata, depresso-turbinata, tenui, læviuscula, diaphana, corneo-fusca, opaciter albo-zonata; spira elevata, apice obtuso; anfractibus 5, convexiusculis, fascia lata alba superficiali, fusco interrupte striata, superne ornatis; ultimo subtus convexo, rude radiato-subplicato, fasciis duabus similibus angustis cincto; apertura obliqua, lunata, intus fuscata; peristomate recto, acuto, margine columellari breviter reflexo, arcuato, intrante, calloso; callo umbilicum omnino tegente.

Diam. major 16, minor 14, axis 9 mill.

Hab. prope Simon's Bay, P. B. S.

I got a single fresh and perfect example adhering to the fleshy leaf of a species of *Cotyledon*, among bushes, on the sand-heaps near the Round Battery at Simon's Town, Cape of Good Hope, in October 1846. Weathered shells, which were whitish, with a fuscous stain underneath, occurred in the drifting sands, with the reversed *Pupa Pottebergensis*, Krauss, and *Cyclostoma affine*, Sow.

There is a single bad specimen of *H. Cotyledonis* in Case 25 of the British Museum collection, without name or locality; and in Case 26 are two smaller examples, in worse condition, presented by Professor M'Gillivray, and marked "from Simon's Bay."

8. *Helix vorticialis*, nobis, n. s.

T. late umbilicata, subdiscoidea, superne depresso-planata, tenui, rufescente-cornea; spira concaviuscula; sutura profunda; anfractibus 4, angustis, convexis, confertim radiato-plicatis, penultimo prominente, ultimo subtus valde convexo; umbilico lato, profundo, omnes anfractus exhibente, margine subangulato; apertura verticali, lunata, subcompressa, marginibus rectis tenuibus, callo tenuissimo junctis.

Diam. major 6, minor 5, axis 3 mill.

Hab. ad Promontorium Bonæ Spei, rarior, sub lapidibus.

Unfrequent near Three-anchor Bay, Green Point; and at Camp

Ground near Rondebosch, adhering to the undersides of stones; alive in May and July 1846; dead at "the Strand," False Bay.

Helix pulchella, well-distinguished by Pfeiffer's diagnosis from *H. costata*, Müller, and which has been noticed as occurring in Europe, from Ireland to Russia, and from Sweden to Switzerland, as well as in Madeira, and through a considerable portion of North America, has extended its range to the Southern hemisphere. I gathered specimens under stones lying on the lawn of High Constantia, near the south-east extremity of Table Mountain. Another European species, *H. cellaria*, is tolerably abundant in the hollows of decayed oaks and willows, in the neighbourhood of Rondebosch, as well as under stones, &c. on the ground. It was probably imported originally from Holland with the trees which it frequents.

Among described indigenous shells, *Helix Menkeana*, Pfr. (of which Krauss obtained only a single specimen on the stem of a *Protea*, near Elim in Zwellendam) occurred to me in bushes shooting out of the sand-hills which border the head of Hout Bay, south of Table Mountain; but it was deficient in similar localities explored near Cape Town and in False Bay.

Helix globulus, Müller (*H. Lucana*, Lamk., nec Müll.), is to be found within a few hundred yards of the coast, both of Table and False Bays, and never, as far as my observations extended, much inland. It burrows in the earth and in sand, and only makes its appearance in the very wettest weather during the winter season, when it may be taken emerging from the ground, or may be traced from its earth-cast. The deserted shells are alone observable at other seasons. The specimens obtainable on the shores of False Bay are larger and more brilliantly coloured than those of Table Bay, and belong to the var. *rosacea* (*H. rosacea*, Lamk.). Krauss notes the species as being only subfossil at Green Point, but I have taken it alive on several parts of that shore.

Helix Capensis, Pfr., is also exclusively a shore-loving species. It is exceedingly abundant on the borders of Table and False Bays and at Green Point, on stones and grass above high-water mark, and for a few hundred yards inland. Those of the southern shores exceed in beauty the shells of the western coast, being variously marked with reddish brown bands or radiate stripes. An internal rib rarely occurs in the right lip, a character which is not noted by Pfeiffer.

February 1850.